

Marshall, Vanessa

From: Crawford, Jennifer
Sent: Wednesday, May 31, 2017 10:04 AM
To: Pepich, Barry; Dodo, Gerald; Adams, Katie; Le, Stephanie; Billings, Melissa; McBride, Theresa; Bailey, Stephanie; Chern, Eunice; Norton, Karen; Wood, Kim
Cc: Young, Margo; Bachman, Brenda; Shephard, Burt; Januch, Jed; Richmond, Brent; Brown, Donald M.; Murchie, Peter
Subject: Discovery Bay Oyster Study, WTR-187A -- FORMAL REQUEST
Attachments: DOC_04_06_1715_06_11.pdf; Discovery Bay Oyster Study ASRF WTR-187A RSCC completed 5-26-2017.pdf; Draft Final Discovery Bay QAPP Sampling Plan 052417 (003).docx

EPA Region 10 Laboratory (MEL)
Formal Analytical Support Request

Project Name: Discovery Bay Oyster Study – Jefferson County, WA

Project Code: WTR-187A

Account Code: 20172018B10P202BD4X24

Sample Numbers: Previously assigned for shells 17120100-0115. Assigned 17234000-4049 for water collection the week of June 4-10, 2017. Unknown regarding sample management of larvae – to be determined.

	Criminal	Superfund Remedial	Compliance Monitoring	Drinking Water Programs	Surface Water Protection	RCRA CA	Brownfields	Other (specify)
-Program / Project*					X			
NPM*	OECA	OSWER	OECA	OW	OW	OSWER	OSWER	

* 'X' the Program/ Project then change 'frequent' NPM below if necessary. For compliance monitoring/criminal projects, also write in the specific data use such as RCRA, NPDES, TSCA, etc. after the 'X'. For surface water, specify 'TMDL' after the 'X' if applicable.

RAP ANALYSES REQUESTED:

PARAMETER OR GROUP OF COMPOUNDS	METHOD	REPORTING LIMITS	# Total Water/Larvae Samples	# Pacific Oyster Shell Samples
Total Metals ^a	EPA 3050B + 6010B	Per MEL ^a	--	16
Larval-Juvenile Bivalve Toxicity Test Protocol for Pacific Oyster	Per QAPP + Lab SOP ^b	Temperature – 0.1°C Dissolved oxygen – 0.1 mg/L Salinity – 0.1 ‰ pH – 0.01 pH unit	2 site waters & Pacific oyster larvae	--

^a See table 2-3, below

^b The draft final lab SOP for the toxicity testing will be updated as necessary during testing so that it reflects the procedures used. *A final SOP document of the toxicity testing should be sent with the laboratory data results when reported by MEL.*

Sampling/Shipping Dates: Previously rec'd oyster shells on 3/22/17. Water samples for toxicity testing will be collected and delivered on 6/6/17 by B.Richmond and J.Januch. Oyster larvae will be delivered by B.Shephard.

Turnaround Time Requested: Standard 8 weeks or per MEL. Please indicate in the formal response what the expected TAT for final data will be.

Q.A. Chemist Reviewing QAPP: Donald M. Brown, RQAM

Final Data Will Be Sent to: Margo Young, Brenda Bachman, Burt Shephard – All EPA staff (Not to OWW project manager)

Who Reviews?: MEL for MEL Data. *Since the toxicity testing is a non-standard analysis, request that copies of toxicity lab book pages and notes, as well as final SOP post-testing be included within the lab data package stored at the lab and later archived (vs references in the file to the lab books).*

Project Manager: Peter Murchie, OWW and Brenda Bachman, OERA **Phone:** Brenda – 206-553-1868 / Peter – 206-553-1148

Has this project been previously requested/if so when? Not formally, however discussed with lab for method development and support since Fall 2016.

Comments: Draft Final QAPP attached. QAPP analytical tables included below. COC for received oyster shells attached – indicates locations and replicates. Number of oysters per sample was not indicated on the COC.

QAPP summary:

The question to be answered is “Identify the cause(s) of toxicity to shellfish at Port Discovery Seafarms.” The observed toxicity may be due to biological, chemical or physical factors in the surface waters of Discovery Bay. It is also possible that a combination of factors is responsible for the observed toxicity. Because different life stages of oysters and other shellfish have differing sensitivities to stressors, it may be possible that toxicity to the different life stages of shellfish, or to the different species of shellfish, may be due to different causes. The study proposed is designed to evaluate these possibilities, although due to the nature of this investigation and limited and seasonal availability of some of the information needed to answer the above question, activities described in this QAPP may occur at different times.

Activities in QAPP:

1. Chemical analysis of oyster shells from Port Discovery Seafarms and Discovery Bay (reference area), to identify if metal concentrations in the shells differ between the two locations. This data may then be used to support a statement about the cause of the 2015 observed mortality and/or discoloration and deformation of shells in adult shellfish (Table 2-1, Activity 4)
2. Determination of whether Discovery Bay water causes significantly more mortality in larval oysters than water from reference and control locations (Table 2-1, Activity 1). If so, toxicity testing of water from these locations may occur, including adjusting water to different pH and ammonia levels, to determine if chemical changes associated with ocean acidification and/or nutrient status are associated with oyster mortality (Table 2-1, Activities 2 and 3)

Requested by: Jennifer Crawford **Date:** May 26, 2017

Chemist/RSCC

Phone: (206) 553-6261

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BELOW FOR LAB USE ONLY

Accepted Parameters:

Rejected Parameters:

Comments:

Transmitted by: Date:

QAPP table info:

TABLE 2-2

Data Needs and Uses

Matrix	Laboratory Analytical Suites	Field Data	Data Use	Data User	Needed Detection Levels
Pacific Oyster Shells	Total TAL metals. Mercury analysis NOT required.	Sample location coordinates Sample description and photographs	Characterize metals in shells. Oysters detoxify excess metals in water and diet by incorporating metals into a biologically unavailable form in their shells	Risk assessors, Chemists	Standard TAL detection limits. Many metals will be at concentrations well in excess of 1 mg/kg dry weight shell. Note that mercury analyses are

TABLE 2-2

Data Needs and Uses

Matrix	Laboratory Analytical Suites	Field Data	Data Use	Data User	Needed Detection Levels
					not required for this work.
Laboratory toxicity test water	<p>Most if not all of the below analytes can be measured by the toxicity testing laboratory.</p> <p>Temperature Dissolved oxygen Conductivity/Salinity pH Total alkalinity* TIC* pCO₂* Ammonia* Sulfide*</p>	Not applicable	Identify the change in pH and other water chemistry parameters associated with increased mortality, decreased development and settling ability in free swimming larval Pacific oysters	Risk assessors, Chemists, Biologists, Toxicologists	<p>Temperature – 0.1°C</p> <p>Dissolved oxygen – 0.1 mg/L</p> <p>Salinity – 0.1 ‰</p> <p>pH – 0.01 pH unit</p> <p>Alkalinity* – 0.1 mg/L</p> <p>Total inorganic carbon* – 0.1 mg/L</p> <p>pCO₂*- 0.1 mg/L</p> <p>Ammonia* – 0.01 mg/L</p> <p>Sulfide* – 0.01 mg/L</p>

* - Analysis only required during toxicity identification evaluation (TIE) studies, not for toxicity tests with unmodified ambient surface waters

TAL = target analyte list

TIC = total inorganic carbon

pCO₂ = partial pressure of carbon dioxide

TABLE 2-3

Oyster Shell Analytical Methods and Estimated Method Reporting Limits

Metal	Analytical Method	MEL Method Reporting Limit (mg/kg dry weight)*	Expected Values/Method Reporting Limit Goals** (mg/kg dry weight)
Al	3050B/6010B	10	200
Sb	3050B/6010B	2	0.02
As	3050B/6010B	4	0.29
Ba	3050B/6010B	0.1	4.1
Be	3050B/6010B	0.1	<0.1
Cd	3050B/6010B	0.2	0.2
Ca	3050B/6010B	5	380,000
Cr	3050B/6010B	0.5	1.2
Co	3050B/6010B	0.5	0.2
Cu	3050B/6010B	0.5	0.6
Fe	3050B/6010B	2	313
Pb	3050B/6010B	2.5	3.8
Mg	3050B/6010B	5	1400
Mn	3050B/6010B	0.2	17
Ni	3050B/6010B	0.5	<1
K	3050B/6010B	70	80
Se	3050B/6010B	5	<0.3
Ag	3050B/6010B	1	0.04
Na	3050B/6010B	10	6500
Tl	3050B/6010B	5	<0.5
Zn	3050B/6010B	0.5	5.2

* Analytical results may in some cases be derived using correction factors from analytical spikes, or from Method of Standard Additions analysis, to overcome matrix interference effects.

** Expected values/ Method Reporting Limit Goals are measured metal concentrations in uncontaminated oyster shells, listed for informational purposes. Metal concentrations in uncontaminated oyster shells taken from multiple literature citations, listed below: